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L4: Entry 13 of 57 File: USPT

DOCUMENT-IDENTIFIER: US 6348420 B1
TITLE: Situ dielectric stacks

Detailed Description Text (35):
FIG. 3 shows a general process sequence in accordance with the invention. As illustrated, a single substrate, including a semiconductor structure, is cleaned 100 to remove contaminants and naturally occurring or native oxide on the semiconductor structure. The semiconductor structure can comprise, among other things, an epitaxial silicon layer or the top surface of a monolithic silicon layer. Conventionally, wafer cleaning prior to gate oxide growth is conducted prior to loading the wafer into the process chamber, and Examples 1-4 and 6 set forth below incorporate such conventional ex situ cleaning. For example, wafers may be cleaned in an SC1/HF wet etch bath. Alternatively, an integrated HF and acetic acid vapor clean can be conducted in a neighboring module within a cluster tool, reducing transport time and opportunity for recontamination or reoxidation. For some applications, the cleaning oxide left by the SCL step is not removed, but is instead used as the initial oxide layer.

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L1: Entry 4 of 11 File: USPT

DOCUMENT-IDENTIFIER: US 6423200 B1
TITLE: Copper interconnect seed layer treatment methods and apparatuses for treating the same

Detailed Description Text (23):
Thus, the in-situ copper pretreatment is configured to remove the copper oxide from the thin seed layer of copper. As explained above, techniques for removing the copper oxide include using a chemical solution bath for rinsing the wafer and removing the copper oxides before the wafer is introduced into the electroplating module. Although specific examples of baths with solutions for removing copper oxides are shown, it is conceivable that the bath can be replaced with a scrub brush apparatus that can scrub the surface of the wafer in order to remove the copper oxides from the copper seed layer before the electroplating is performed in the electroplating module. In either case, the pretreatment is preferably performed in an electroplating apparatus that is in the form of a cluster architecture, and thus enables immediate electroplating just after the pretreatment is performed in-situ in the treatment module 204.

scrub in each process in cluster

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L1: Entry 6 of 11 File: USPT

DOCUMENT-IDENTIFIER: US 6132289 A
TITLE: Apparatus and method for film thickness measurement integrated into a wafer load/unload unit

integration of scrub and prog

Detailed Description Text (31):
Finally, as noted in FIG. 2, when the wafer is removed from the cluster modules by the operation of the wet robot arm 37, the wafer can be moved to the wet queue module 38 to await the final clean or it can be moved to the scrubber/clean module 39 for the final cleaning. This module 39 includes a load position unit 80 for accepting the wafer from the wet robot arm 37, two brushes 81 and a spin station 82 to perform the scrubbing and final spin cleaning. Subsequently, the dry robot arm 33 picks up the wafer from the spin station 82 and moves the wafer to the I/O module 31 for removal from the tool 30. Also noted in FIG. 3 is a control module 70, which contains the necessary control elements (such as a processor for operating the tool and obtaining the measurement) and user interface for operation of the tool 30.